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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/441,380	11/16/1999	JERRELL P. HEIN	75622.P0007	4250

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DAVIS & ASSOCIATES
P.O. BOX 1093
DRIPPING SPRINGS, TX 78620

EXAMINER	
SINGH, RAMNANDAN P	
ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/441,380	HEIN, JERRELL P.	
	Examiner	Art Unit	
	Ramnandan Singh	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-16* is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 17 May 2004 with respect to claims 1-12 have been fully considered but they are not persuasive.

(i) Applicant's argument—" Contrary to the Examiner's assertions, Kaplan does not teach or disclose determining a semiconductor junction temperature" on page 12.

Examiner's response--- The examiner respectfully disagreed. Kaplan teaches computing an instantaneous power dissipation ($I_C x V_{CE}$) of transistor Q_P [Fig. 1; col. 2, lines 15-38], and that the voltage across the semiconductor is proportional to the logarithm of the current therethrough. Kaplan further discloses determining the temperature of the semiconductor using the voltage across the semiconductor wherein voltage is proportional to temperature [col. 4, lines 32-63; col. 6, lines 18-25].

(ii) Applicant's argument—"Applicant submits that the Examiner's alleged suggestion or motivation has no support and appears to be an impressible use of hindsight" on page 13.

Examiner's response—The Examiner disagreed. In this context, the Examiner respectfully directs the Applicant to the Kaplan's statement: "It is often desirable to limit the power dissipation in an output transistor in order to protect such transistor from

damage" [col. 1, lines 11-39] wherein the high power dissipation results in a thermal shutdown [col. 6, lines 18-25]. Further, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(iii) Applicant's argument—" Is the circuit of Kaplan added to the microprocessor of Zhang ? If so, please indicate how it operates with the stored values to teach calculation or estimation of instantaneous power dissipation as alleged by the Examiner" on page 13.

Examiner's response— The circuit of Kaplan is not added to the microprocessor of Zhang. Zhang teaches sampling analog signals and storing the sampled outputs in a programmable microprocessor 214 for further processing. It is nevertheless a teaching to one of ordinary skill in the art to do the same thing with Kaplan. Thus the teaching of Zhang is added to Kaplan to estimate the instantaneous power dissipation of a transistor in a digital domain, in stead of doing that in the analog domain as done by Kaplan. The motivation for doing this is that it is very easy to store

digital data . In addition, processing and communicating with digital data is very efficient and cheap. On the other hand, analog data require special devices for processing, storing and communication, and are unique to a specific application.

2. **Status of Claims**

Claims 1, 5 and 13 are amended.

Claims 1-16 are pending.

3. **Change of Scope**

With the amendment to the claims, new grounds of rejection are made.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaplan [US 4,355,341] in view of Zhang [US 5,881,130].

Regarding claim 1, Kaplan teaches computing an instantaneous power dissipation ($I_C x V_{CE}$) of transistor Q_P, a linefeed component [Fig. 1; col. 2, lines 15-38; col. 1, lines 19-39], and that the voltage across the semiconductor is proportional to the

logarithm of the current therethrough. Kaplan further discloses determining the junction temperature of the semiconductor using the voltage across the semiconductor wherein voltage is proportional to temperature [col. 4, lines 32-63; col. 6, lines 18-25].

Kaplan does not teach expressly sampling at least one of a tip and a ring signal to determine a line voltage and a line current of a linefeed component of a subscriber loop for estimating an instantaneous power dissipation of the linefeed component. However, it may be noted that sensing and sampling of a TIP signal and a RING signal are well-known in the art.

Zhang teaches a method and apparatus for sampling a TIP signal and a RING signal for use by the signal processor 214 of a telephone line. Fig. 1 shows a switched telephone network, wherein lines TIP and RING run to switch 114, and are connected to one of the subscriber lines 112A or 112B. Further, Fig. 2 shows a portion 200 of measurement unit 116 comprising interface and control circuitry 212 and detection circuit 210. The detection circuit 210 includes programmable microprocessor circuitry 214 which may be a general purpose signal processor [col. 3, lines 29-39]. Current amplifier 224 and voltage amplifier 226 are coupled to the TIP and RING lines, wherein the outputs of current amplifier 224 and voltage amplifier 226 are provided to Analog to Digital Converter (ADC) 222. The ADC 222 converts the current and voltage signals into digital forms and passes the **samples** to microprocessor 214 [col. 3 line 66 to col. 4, line 48], wherein **the samples are stored in memory in microprocessor circuitry**

214 for later processing [Figs. 2, 3; col. 8, lines 34-37]. In essence, Zhang teaches sampling analog signals and storing the sampled outputs in a programmable microprocessor 214 for further processing. It is nevertheless a teaching to one of ordinary skill in the art to do the same thing with Kaplan. Thus the teaching of Zhang is added to Kaplan to estimate the instantaneous power dissipation of a transistor in a digital domain, in stead of doing that in the analog domain as done by Kaplan.

The suggestion/motivation for doing would have been the ease to store digital data. Further, processing and communicating with digital data in a very efficient and cheap way is well-known in the art. On the other hand, analog data require special devices for processing, storing and communication, and are unique to a specific application.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Zhang with Kaplan to estimate the instantaneous power of a linefeed component in a digital domain.

Claim 5 is essentially similar to Claim 1 and is rejected for the reasons stated above.

Claim 7 is also essentially similar to Claim 1 except for an analog-to-digital converter (ADC) for sampling at least one of a Tip signal and a RING signal. It may,

however, noted that Zhang teaches an ADC 222 for sampling at least one of a Tip signal and a RING signal shown in Fig. 2.

Regarding claims 2, 6 and 8, Kaplan teaches a threshold comparator 16 to compare the voltage sum on conductor 30 to a reference potential V_{REF} supplied on conductor 28 for protecting transistor Q_P. This threshold voltage represents an alarm temperature the component [Figs. 1-3; col. 2, lines 4-14; col. 2, lines 32-42; col. 4, lines 44-49; col. 5, lines 3-9].

Regarding claim 3, Zhang teaches an interface and control circuitry 212 that provides an **interface** to switch 114. As a result, the combination of Zhang and Kaplan can monitor each linefeed component connected to the subscriber loop interface.

Regarding claim 4, Zhang teaches microprocessor circuitry 214 that is programmable [Zhang; col. 9, lines 19-32].

6. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kaplan and Zhang as applied to claim 7 above, and further in view of Gold et al [US 5,488,631].

Regarding Claim 9, the combination of Zhang and Kaplan does not teach expressly using a multiplexer coupling for a telephone line. It may, however, be noted

that using multiplexed telephone signals for telephonic communications is well-known in the art.

Gold et al teaches using a microprocessor which is a 8-bit general purpose micro-controller integrated circuit (IC) chip providing all functions not directly part of user communication data. These functions include a multiplexed high-speed 8-bit analog-to-digital conversion (ADC) capability for processing filtered analog signals to digital values [col. 9, lines 7-40].

Zhang , Halbig, and Gold et al are analogous art because they are from a similar problem solving area, viz. , telephonic communications.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide the multiplexer coupling of Gold et al with the microprocessor 214 of Zhang.

The suggestion/motivation for doing so would have been to provide the ability to the combined system of Zhang and Kaplan with a given bandwidth, to transmit more data and more free of interference from other types of devices [Gold et al; col. 1, lines 32-50].

Regarding Claim 10, Gold et al teaches time-division multiplexing communications systems to accommodate all the functions which can support a higher data rate [col. 1, lines 9-31; col. 2, lines 5-12].

Regarding claim 11, Gold et al teaches a microprocessor which is an 8-bit processor integrated circuit (IC) chip [col. 9, lines 609].

Regarding claim 12, Gold et al teaches a non-volatile memory (NMRAM) wherein parameters and a program could be stored [col. 9, lines 19-30].

Allowable Subject Matter

7. Claims 13-16 are allowed.

8. Examiner's Statement of Reasons for Allowance:

Claim 13 identifies the uniquely distinct feature of a subscriber loop interface circuit apparatus comprising: a signal processor having sense inputs for receiving a sensed tip signal and a sensed ring signal from a tip line and a ring line of a subscriber loop; and a linefeed driver for driving the subscriber loop in according with the subscriber loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line and a ring fuse series-coupled to the ring line , wherein the sensed tip signal includes first and second sampled tip voltages sampled from opposing sides of

the tip fuse, wherein the sensed ring signal includes first and second sampled ring voltages sampled from opposing ends of the ring fuse, as shown in Applicant's figures 3 and 5. As such, claim 13 requires a sensed tip signal including first and second sampled tip voltages sampled from opposing sides of the tip fuse and a sensed ring signal including first and second sampled ring voltages sampled from opposing ends of the ring fuse. While the closest prior art, Halbig [US 4,856,059], Kaplan [US 4,355,341], Zhang [US 5,881,130] and Patel [US 4,982,307] each teaching sensing signals for estimating power dissipation, Halbig sensing inputs for receiving a sensed tip signal and a sensed ring signal, Kaplan estimating an instantaneous power dissipation of a transistor, Zhang sampling a tip and a ring signal to determine a line voltage and a line current, and Patel sensing inputs from a tip and a ring; none of them suggest a sensed tip signal including first and second sampled tip voltages sampled from opposing sides of the tip fuse or a sensed ring signal including first and second sampled ring voltages sampled from opposing ends of the ring fuse. As such, the prior art, either singularly or in combination, fail to anticipate or render the above underlined limitation obvious. Therefore, claim 13 is allowable.

Claims 15 and 16 are essentially similar to claim 13 and hence they are allowable.

Claim 14 is allowable due to dependence from claim 13.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ramnandan Singh
Examiner
Art Unit 2644

FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER